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(58) Field of search

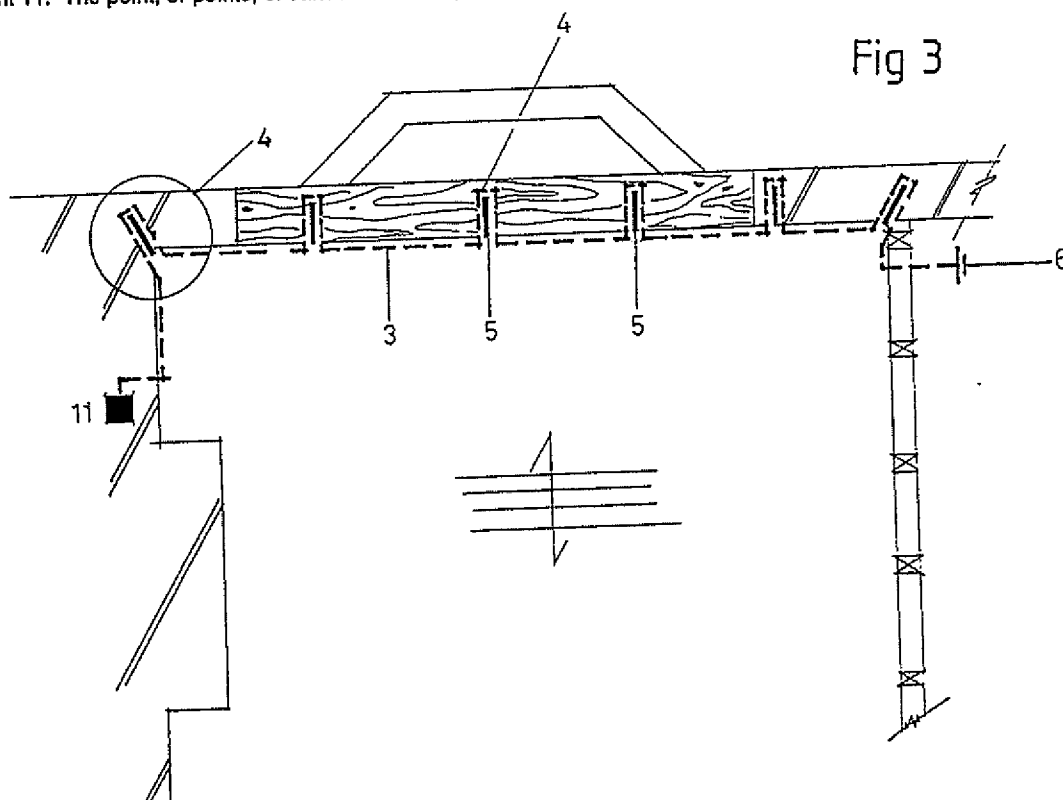
UK CL (Edition K) G1N NACL NADF NAEP, G4N

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(54) Continuous moisture detection, locating and monitoring apparatus

(57) A continuous moisture detecting, locating and monitoring tape 3 consisting of at least two powered and neutral conductive elements which are fixed, separated and protected by permeable adhesive insulation is permanently installed in existing structures or incorporated in the construction process of new structures, including walls, frameworks, and earth and water retaining structures. The presence of moisture at any part of the tape will short the circuit or alter the resistance of the circuit thereby activating a warning device and/or data recording and retrieval system at central collection points such as point 11. The point, or points, of varied resistance, or short circuit can be located via a signal input facility.



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Fig 1

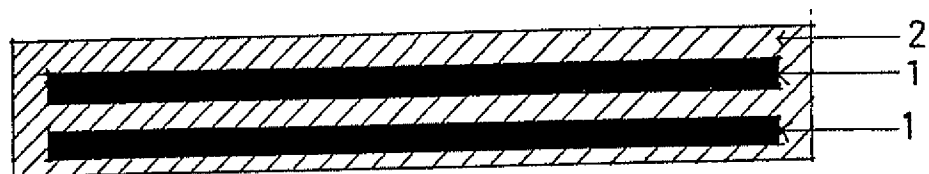
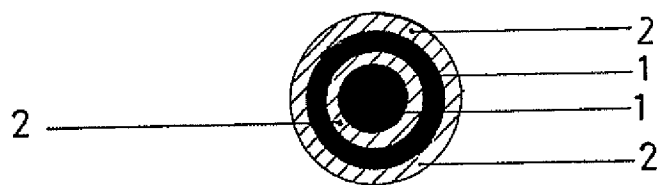
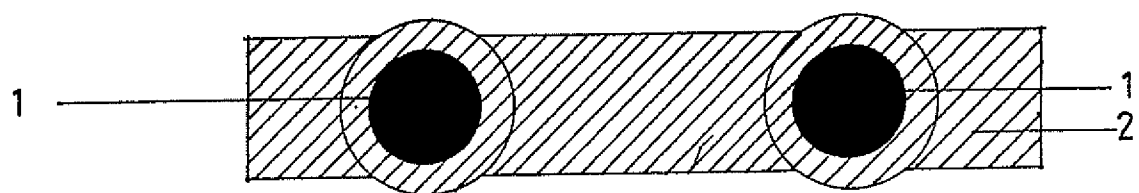


Fig 2

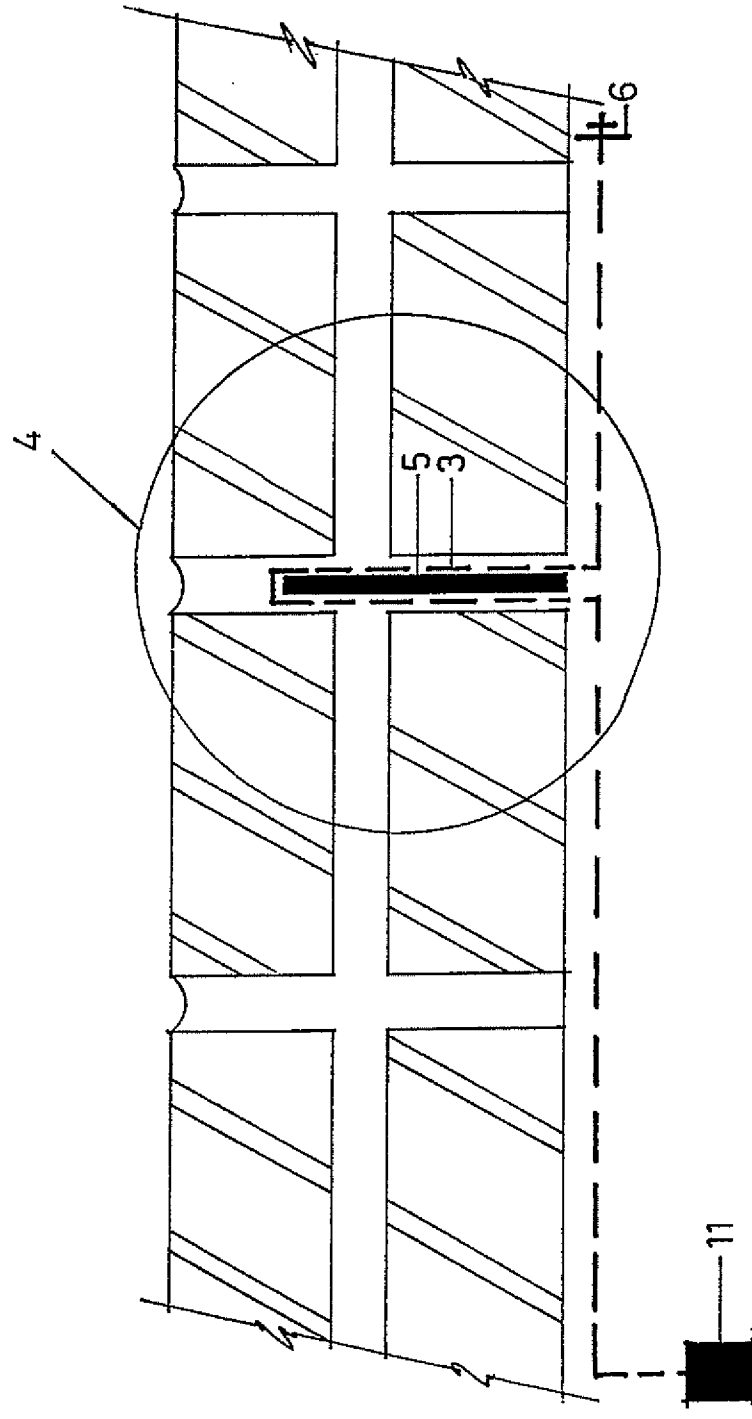


Fig 3

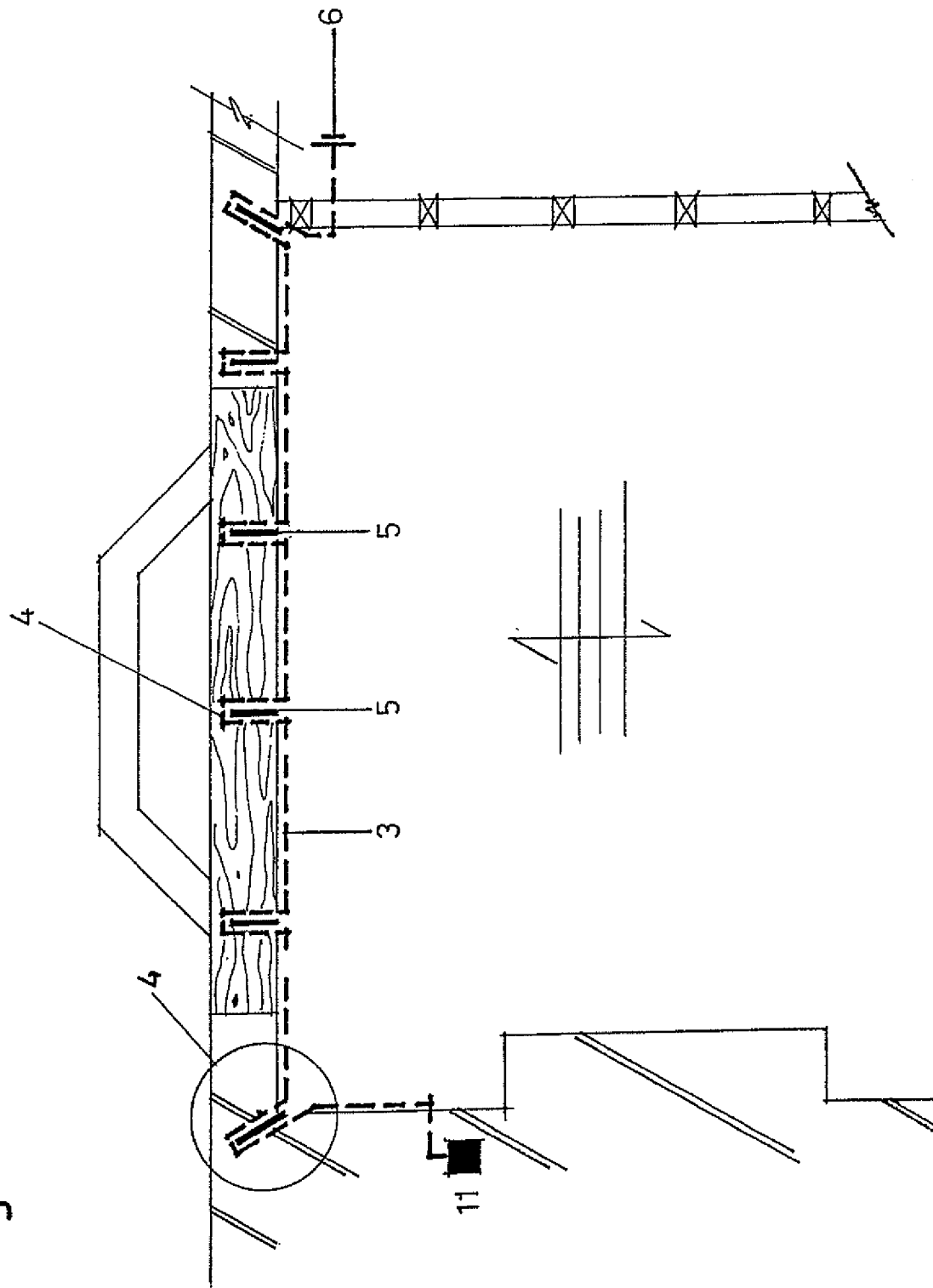


Fig 4

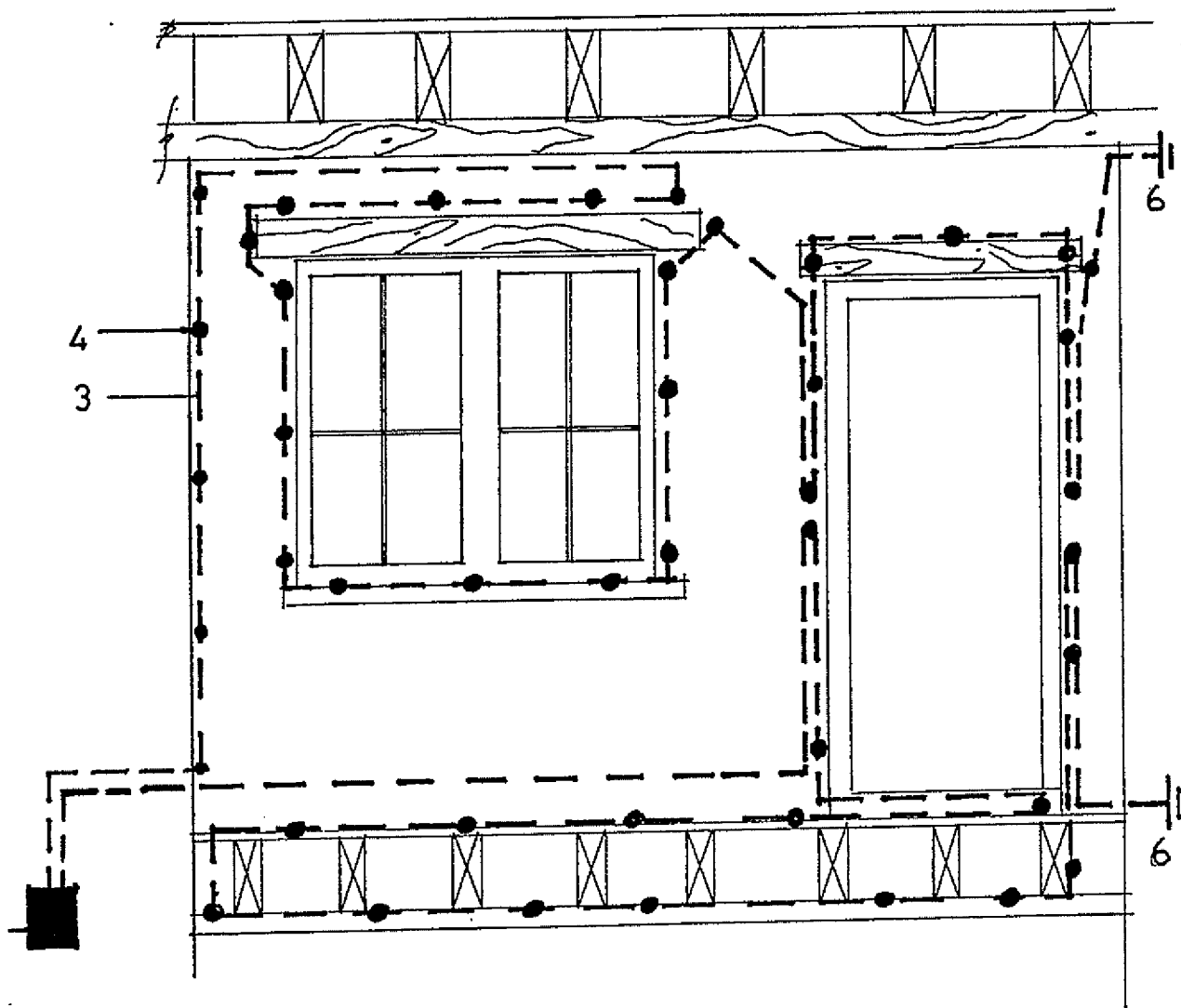


Fig 5

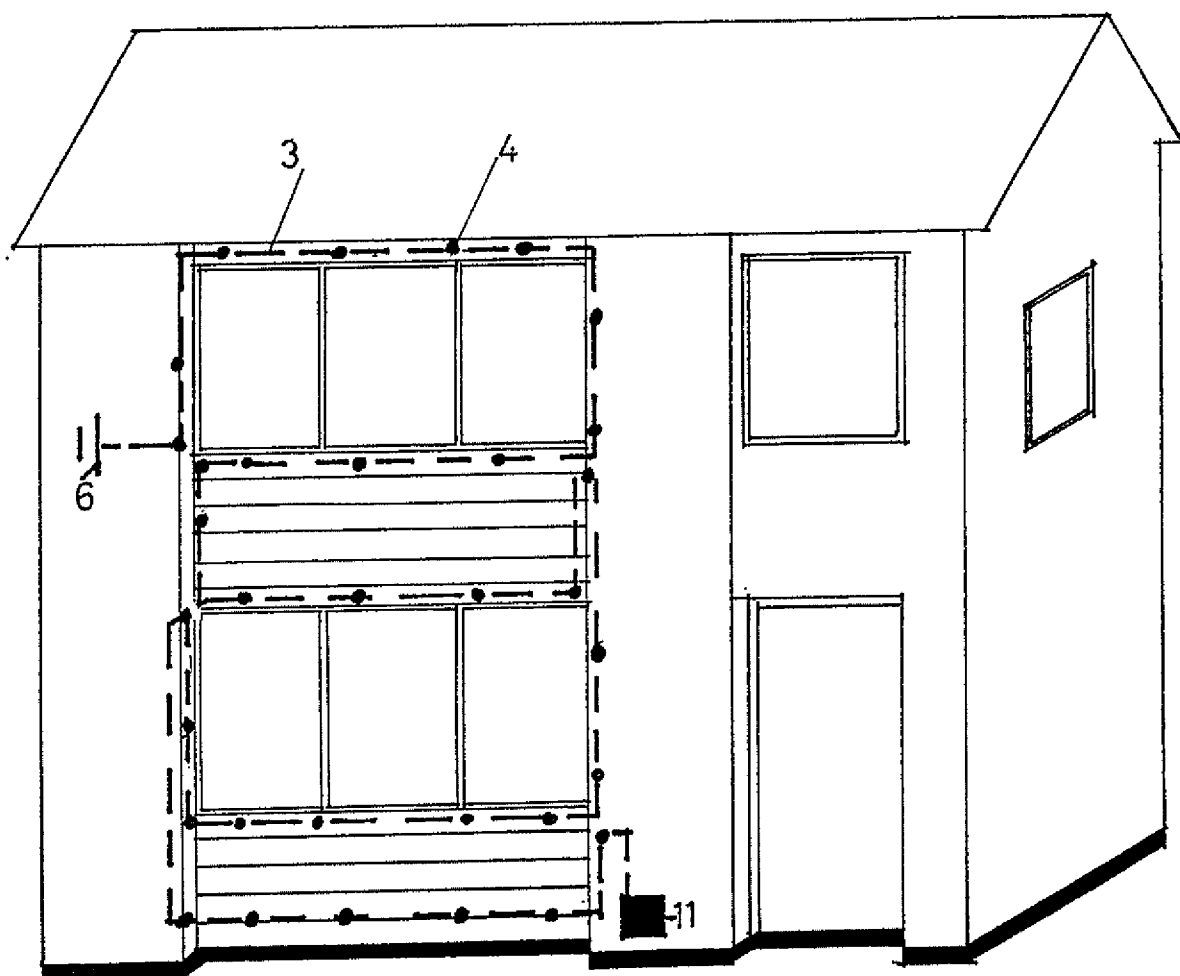


Fig 6

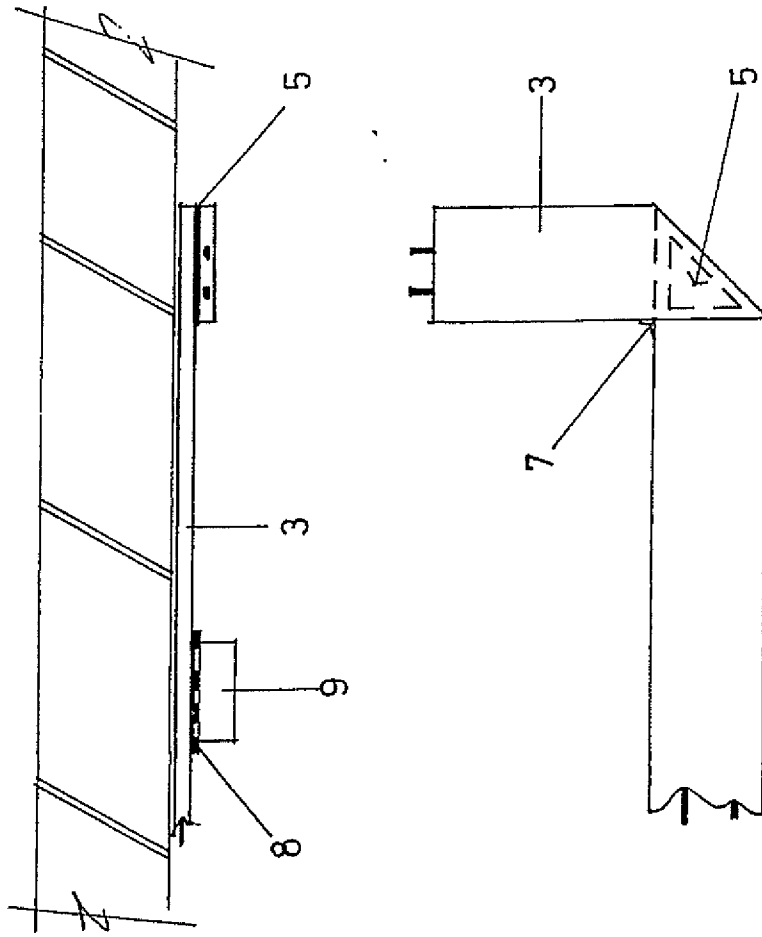


Fig 7

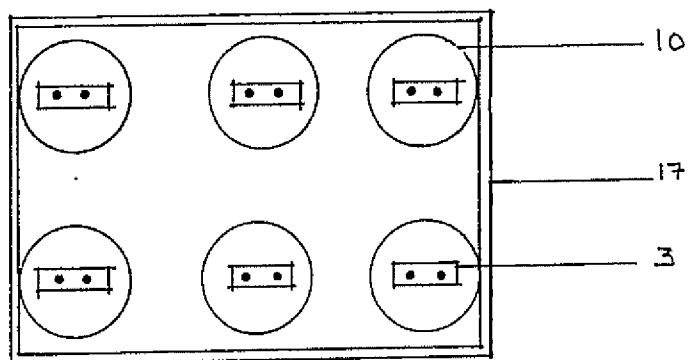
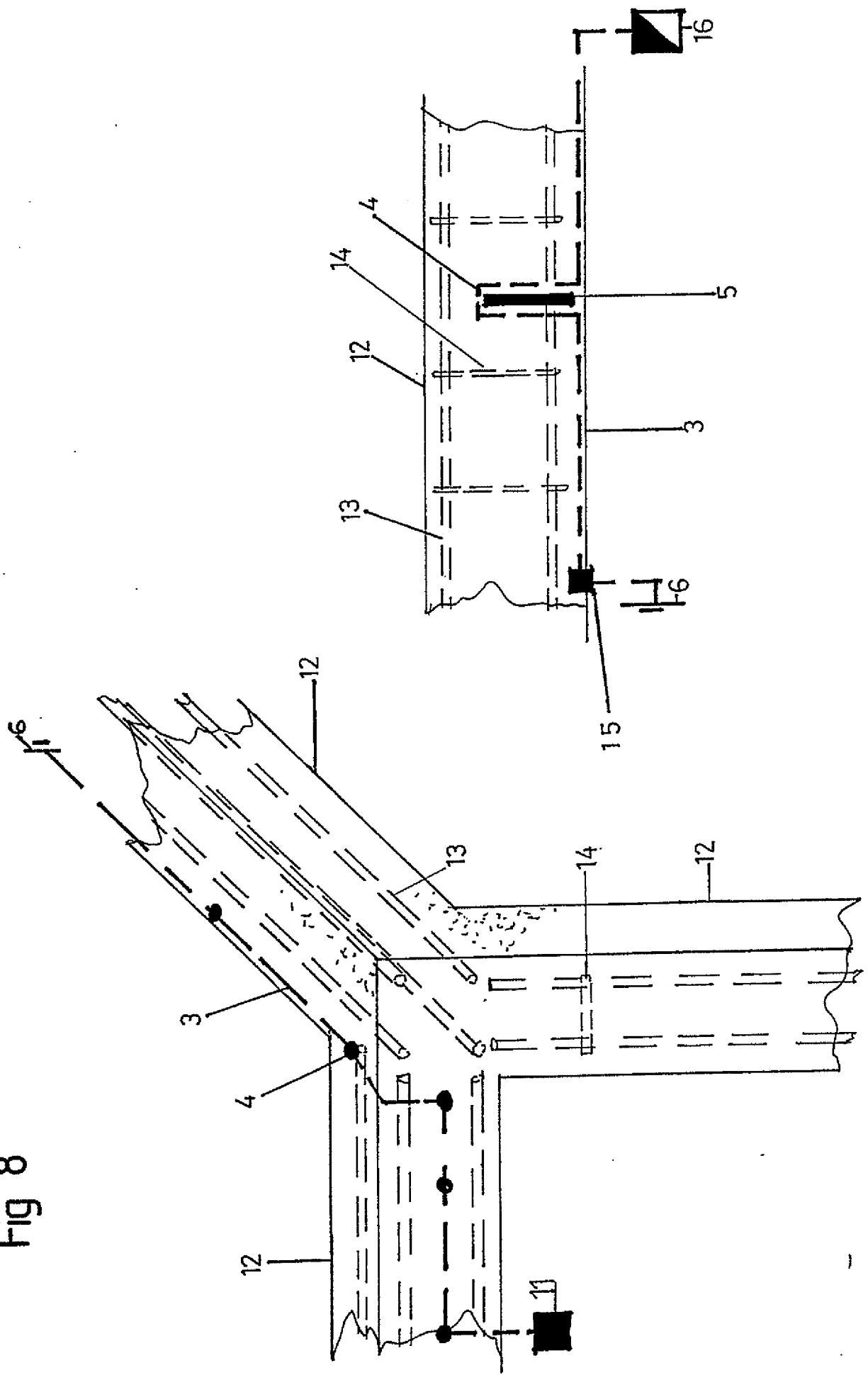


Fig 8



This invention relates to a continuous moisture detection locating and monitoring apparatus.

Existing moisture detection equipment for structures depend upon individual moisture meters which rely on surface readings or isolated destructive sampling methods to determine the presence of, or specific moisture contents of component materials.

According to the present invention there is provided a series of continuous electrically conductive circuits permanently installed in existing structures, or incorporated in the construction process of new structures, including earth and water retaining structures, connected to a power source and a central information collection point.

The conductive circuits comprise two flexible non-corrosive non-degradable elements separated and protected by suitable flexible, permeable, insulation. The conductive elements typically, but not exclusively, may be formed of carbon fibre.

One element is permanently connected to a low voltage power source, the other is maintained in a neutral state. All elements are individually connected to the central collection points which incorporate suitable warning devices and/or a data storage and retrieval systems, and/or a signal input facilities.

A specific embodiment of the invention will now be described by way of example with reference to accompanying drawings in which:-

FIG 1 shows, in section three possible arrangements of the conductive elements.

FIG 2 in section, shows detail of a typical extension loop into a solid brick and mortar wall.

FIG 3 shows, in section, the layout of a conductive circuit in a solid load bearing brick and mortar external wall with integral load bearing timbers.

FIG 4 shows in elevation a part process installation with extension loops in a load bearing external brick and mortar wall having load bearing timber elements integral with the brickwork.

FIG 5 shows in perspective a part process incorporated in a typical timber framed structure where the timber frame itself comprises the main load bearing element.

FIG 6 shows in section a positional change with additional permeable insulation and additional conventional isolating material at, or adjacent to, typical conductors employed in the construction process [metal conduit or the like].

FIG 7 shows in section the sleeved detection and monitoring tape within the central ducting.

FIG 8 shows in perspective and section a part system installed in part of a reinforced concrete structure.

By way of example only and referring to the drawings the process comprises conductive elements 1 which typically, but not exclusively, may be formed of carbon fibre, in suitable permeable adhesive insulation 2 forming detection locating and monitoring tape 3 fixed to the structure, or structural components with suitable non conductive fixings, and intermittently recessed into the structure or structural components by way of extension loops 4 with additional permeable insulation 5 or suitable non-permeable insulation 8. Either of the insulated elements 1 in the detection locating and monitoring tape 3 is connected to a low voltage power source 6 which may be a battery or alternatively it may be powered from the mains electricity supply with suitable transformers. The remaining insulated element 1 in the detection and monitoring tape 3 is maintained in a neutral state. All circuits of the detection locating and monitoring tape 3 are routed to a central ducting 17 where they are individually isolated by protective sleeves 10 within the central ducting 17. Sleeved tapes are then connected to the central information point.

Additional permeable insulation 5 is employed at points of positional change 7 and additional conventional isolating material 8 is used at or adjacent to any typical conductors [e.g. metal conduit 9].

The presence of moisture at any part of the tape will complete or short the circuit or alter the resistance of the circuit thereby activating a warning device and/or data recording and retrieval system. The point of completion or short circuit or varied resistance can be located by feeding a radio signal into the system and tracing the detection locating and monitoring tape 3 with a frequency receiver.

By way of secondary example only and referring to the drawings the process can also comprise conductive element 1 which typically, but not exclusively, may be formed of carbon fibre in suitable permeable adhesive insulation forming detection locating and monitoring tape 3 incorporated in new construction e.g. reinforced concrete beams 12 where embedded steel reinforcement rods 13 are interconnected with additional reinforcement 14. A power source 6 is applied at input terminal 15 where upon moisture on any part of the detection locating and monitoring tape 3 or extension loop 4 completes or shorts the circuit or alters the resistance and is detected and/or located and/or monitored at data collection point 16 by means of suitable portable, locating, detecting and/or monitoring equipment.

WHAT WE CLAIM IS

1.

Continuous, permanent, in-situ, non-destructive, moisture detection locating and monitoring apparatus for structures; in which two or more continuous flexible non-corrosive non-degradable electrically conductive elements are separated, fixed and protected by flexible permeable insulation. The conductive elements typically, but not exclusively, may be formed of carbon fibre.

The electrical conductive elements forming parts of a series of electrical circuits which, in the presence of moisture at any point of the circuit will complete or short the circuit or alter the resistance thereby activating a warning device and/or data recording and retrieval system at a central collection point. The point, or points, of altered resistance or short circuit can be located via a signal input facility used in conjunction with a frequency receiver.

2.

A moisture detection, locating and monitoring apparatus as detailed in 1. intermittently powered for periodic inspection purposes to produce data relating to the status of the circuit or circuits by way of suitable portable detection equipment.